

REMARKS

STATUS SUMMARY

Claims 1–4 are pending in the present application. The Examiner has objected to the drawings, the specification, and the claims for certain formalities. The Examiner has rejected claims 3 and 4 under 35 U.S.C. § 112, second paragraph, and has also rejected claims 1-4 under 35 U.S.C. § 103(a). Claims 1 and 3 have been amended. Additionally, new claims 5-20 have been added.

AMENDMENTS TO DRAWINGS

The drawings are objected to because reference character “120” has been used to designate both a device, the comb filter, and a signal. Also, reference character “132” has been used to designate both FFT in element 106 of FIG. 1 and the duplexer in element 102 of FIG. 1. And block 132 in element 102 of FIG. 1 does not have a descriptive label.

Applicants have remedied these matters by the following amendments. First, reference character “112” is now used to identify the signal into mixer 110, and the lead line has been moved to indicate that the reference character “112” refers to the signal into mixer 110 rather than block L1. In addition, FIGs. 2A and 2B have been amended in that the reference character “112” has been changed to “113” in FIG. 2A, and the reference character “120” has been changed to “113” in FIG. 2B.

FIG. 1 has also been amended by designating the duplexer in element 106 of FIG. 1 as “154”, and by labeling block 132 in element 102 of FIG. 1 as “Duplexer”. In addition, other

corrections have been made to FIG. 1. Arrow heads have been added to signals 118, 122, 127, and 130 of element 102, and to signals 140, 142, and 144, of element 106, as well as the lines into mixer 156 and the duplexer(unlabeled), to indicate the direction of the signal flow.

Changes has also been made to FIG. 2F, which has been amended by changing the reference character “130” to “127”. This conforms to page 8, lines 4-8, which states that FIG. 2F shows the first stage of compression prior to bandpass filtering by filter 128.

In view of the foregoing, Applicant respectfully submits that the objections to the drawings has been overcome, and request that these objections be withdrawn.

AMENDMENTS TO SPECIFICATION

Page 4, line 5, of the specification has been objected to because the reference to FIGs. 2A-2H does not have separate descriptions of each of these figures. The appropriate paragraphs have been added to the specification. Also, corrections were required on page 7, line 12, and page 8, line 22, Applicant has made these changes to the specification.

Additional changes were made to the specification, which include changing “remote unit 104” on page 7, lines 12-13, to “remote receiver 102”, changing the reference character “112” on page 7, lines 17 and 22, to reference character “113”, adding the reference character “106” on page 9, line7, and other minor corrections of typographical errors.

AMENDMENTS TO CLAIMS

Claims 1-4 are objected to because in the original claim 1, line 5, it was suggested that “a” be changed to “the”. Applicant respectfully traverses this objection because in claim 1, line 1 refers to a method for compressing a GPS signal, line 2 refers to matching a comb filter to the GPS signal to obtain a first output comprising filter lines, and line 5 refers to frequency shifting the filter lines in the first output to produce a *compressed* GPS signal. Therefore, it appears that claim 1 is acceptably clear with respect to the references between the limitations of the claim and Applicant respectfully request that the Examiner withdraw the objections.

CLAIM REJECTION - 35 U.S.C. § 112, SECOND PARAGRAPH

Claims 3 and 4 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that the applicant regards as the invention. Specifically, the Examiner states that “the GPS receiver” in claim 3, line 2, lacks antecedent basis.

Applicant has amended claim 3 to delete the entire phrase containing the term “the GPS receiver” and therefore this rejection is now moot. In view of the foregoing, Applicant respectfully submits that the rejection to claim 3 under 35 U.S.C. § 112, second paragraph, has been overcome, and requests that this rejection be withdrawn.

CLAIM REJECTIONS - 35 U.S.C. § 103

Claims 1-4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,757,916 issued to MacDoran et al. ("MacDoran '916") in view of U.S. Patent No. 4,797,677 issued to MacDoran et al. ("MacDoran '677"). Applicant respectfully traverses these rejections because the cited references in combination fail to teach or suggest all the features or elements recited in each of the rejected claims.

The Examiner states that the modified/combined apparatus and method of MacDoran '916 and MacDoran '677 teach the following (referring to FIG. 3 of MacDoran '677):

removing the carrier component (L_1/L_2) of the received GPS signals from antenna 30 by the multipliers 44 and 80;

matching a comb filter (element 62, or 72) to the received GPS signals inputted to the multiplier 68 (column 6 lines 32-40), where the received GPS signals comprises filter lines (the GPS signals shown as filter lines in spectrum); and

frequency shifting the received GPS signals inputted to the multiplier 68, with the comb filter to produce a compressed signal of the filter lines at the output of element 72.

Wherein the received GPS signals are separated from each other by a comb filter (elements 62, or 72 Fig. 3 '677) stated in column 11 lines 15-20; and the delay elements and the multipliers of Fig. 3 with the bank of comb filters comprised in the channel spectral compressor (delay and multiply) (404/405 Fig.4 '916) compress the GPS signals.

This modified/combined apparatus and method fails to teach each and every element or feature recited in the rejected claim. In general, MacDoran '677 teaches a method and apparatus for deriving the pseudo range of the user from a satellite without knowledge of the code sequence of the modulation carried by the signal from the satellite, if any. (Col. 2, lines 16-19.) This is

done by recovering selected components of the satellite signal. With respect to the filters (elements 62 and 72, FIG. 3 of MacDoran '677), these filters, as well as filters 52, 88, and 98, are bandpass filters with the pass bands being the number in parentheses inside the filter block. (Col. 5, lines 48-50.) The output of each bandpass filter is then downconverted utilizing tones from synthesizer 40 in another mixer coupled to a signal processor for each selected component of the satellite signal.

This element of the modified/combined apparatus and method does not teach the matching of a comb filter to a received GPS signal to obtain a first output signal comprising filter lines of claim 1, wherein the resultant signal 118 is filtered in a 1 kHz comb filter 120. (Page 7, line 4.) As shown in FIG. 2D, the frequency spectrum of signal 122 output from the comb filter 120 is a series of signals, the number is dependent on the number of taps in the comb filter 120.

As for the frequency shifting of the filter lines in the first output signal, the modified/combined apparatus and method also fails to teach mixing signal 118 with the output of frequency generators 124, which may produce a series of signals at different frequencies, as shown in FIG. 2E. (Page 8, lines 3-5). In contrast, the modified/combined apparatus and method refers to producing a compressed signal of the filter lines at the output of element 72, which is, again, a bandpass filter.

Claims 2, 3, and 4 depend directly or indirectly from claim 1, and therefore are distinguishable over the modified/combined apparatus and method of MacDoran '916 and MacDoran '677 for at least the same reasons.

In view of the foregoing, Applicant respectfully submits that that claims 1, 2, 3, and 4 are patentable under 35 U.S.C. § 103(a) over MacDoran '916 and MacDoran '677, and therefore requests that the rejection of claims 1, 2, 3, and 4 under 35 U.S.C. § 103(a) be withdrawn.

Moreover, the “frequency shifting the filter lines of the first output” of claim 1 refers to mixing the output 122 of the comb filter 120 with outputs from frequency generators 124 into mixers 126. Page 7, lines 5-5. This is not taught by the frequency shifting cited by the Examiner when the Examiner refers to multiplier 68, which introduces a time delay into a GPS signal output from a power divider. (Col. 6, lines 32-37).

CONCLUSION

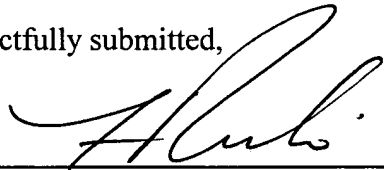
In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Examiner has had an opportunity to review the above Remarks, the Examiner is respectfully requested to telephone the undersigned attorney for the Applicant in order to resolve these matters and avoid the issuance of another Official Action.

Respectfully submitted,

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By: _____



Francisco A. Rubio-Campos
Registration No. 45,358
Attorney for Applicant
Phone: (949) 448-9410
Fax: (714) 948-8903

The Eclipse Group
26895 Aliso Creek Road
Suite B-104
Aliso Viejo, CA 92656-5301

Customer No. **34408**

AMENDMENTS

TO THE DRAWINGS

Please enter the Replacement Sheets for FIGs. 1, 2A, 2B, and 2F attached hereto.

Amendments have been made to FIGs. 1, 2A, 2B, and 2F as discussed below.

Attachment: Replacement Sheet FIG. 1
Replacement Sheet FIG. 2A
Replacement Sheet FIG. 2B
Replacement Sheet FIG. 2F